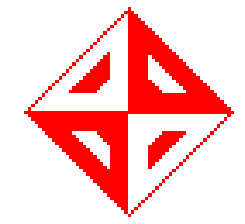


WEB-BASED CINEMA APPLICATION



SE 560 Design Report

submitted to

Department of Computer Engineering

by

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1- Introduction

Due to the rapidly increasing amount of internet usage and the improvements in the data security over internet, online shopping concept becomes more preferable over traditional shopping. Hence, an online Mobile Cinema Reservation System enabling users to search films, see the film details and schedule, purchase and reserve tickets thought to be a usefull application.

As mentioned above, online shopping concept becomes increasingly popular. However, this popularity brings some troubles within. One of this troubles is the rapidly changing requirements and short deadlines to develop secure applications satisfying user needs. So one of the key concepts that we consider in our design is to lower the implementation efforts. Thus, in this circumstances we select Oracle APEX (Oracle Application Express) as our development environment in this project.

1.1 Problem Definition

Purchasing or reserving cinema tickets are one of the most frequently used online shopping activity. There are many cinemas showing many films with different schedules and seat plans. Therefore, sometimes it may be really confusing to decide on which film, in which cinema and when. In order to cope with such difficulties, an application enabling customers to search films, see the film details and schedule, purchase and reserve tickets as well as define, update schedule and cinema informations for cinema owners would be time saving. So, the Mobile Cinema Reservation System seems to be a perfect solution for the problem definition mentioned above.

1.2 Project Scope

Cinema Reservation System will be a web-based application enabling its users to achieve many activities by just using a web browser.

Mobile Cinema Reservation System will provide an authentication mechanism for different user types. Every user will be assigned to some role and these roles could only achieve some certain tasks. There will be four roles in the application. These roles are defined as follows:

- **Administrators.** Administrators has the highest level of privileges and can assign roles to users and manages the user accounts.
- **Managers.** Management staff can define a seating plan for cinema saloon, can define schedule for saloons and can define ticket price.
- **Customers.** Customers can reserve, purchase or cancel a seat, search for a movie according to different criterias including a range based search, can view movie details and can rate movies.
- **Visitor.** Visitors which are the unregistered users can only query cinema and movies but can neither purchase/reserve tickets nor rate films.

Mobile Cinema Reservation System will provide a sign up screen for unregistered users. A user detail screen will appear to each user who wants to sign up. Users fill the details and submit this information to the system. After signing up they become registered users and could fully benefit from the system.

For registered users a sign in screen will be displayed. After the user signs in then s/he can take many actions according to his/her role as described above.

As described above, managers can define a seating plan for cinema saloon from a grid based screen by selecting the seats, corridors, entrance and cinema screen. In addition to managers can setup a saloon schedule from another screen.

Customers, being another user type can select a seat by clicking on it from a grid based screen and purchase or reserve it. In addition to that customers are enabled to make different types of queries including a range based search from a GIS screen by supplying the intended range.

1.3 Design Objectives

1.3.1 Usability

As every valuable software this web based cinema application will also be easily usable. Since this application is highly user interactive, usability is one of the most important requirement in our software.

1.3.2 Security

Since this is a web based cinema application, security seems to be a really important factor. As mentioned we will use ORACLE as database and APEX as development environment. Thus we will rely on the security considerations that is provided by ORACLE and APEX which is quite reliable.

1.3.3 Portability

Portability is an another important software quality factor. Web based Cinema Application will be able to accessed from various platforms and portable across these platforms too.

1.3.4 Performance

Performance is an important issue for web based cinema application since the application is highly interactive (different types of queries etc...). Hence, process delays have to be acceptable. Since we will use APEX as development environment and PL-SQL as development language, we believe that the performance of queries and other database interactions will be quite short.

2- Overall Architecture

The overall architecture of the Web Based Cinema Reservation System is quite simple. The architecture is a 2-tier architecture using also an embedded PL/SQL gateway as shown in Figure.

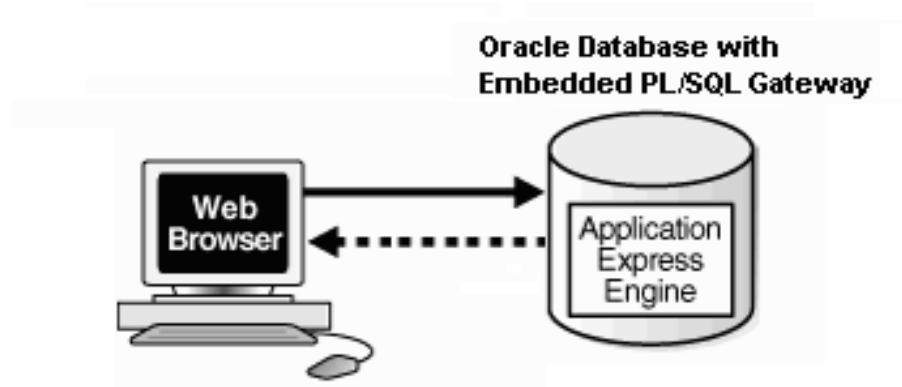


Figure 1. Overall Architecture

PL/SQL Gateway

The inclusion of the embedded PL/SQL gateway simplifies the architecture and eliminates the middle tier, and reducing the architecture from 3-tier to 2-tier. PL/SQL gateway provides a web server handling the incoming requests and runs in XML DB HTTP server in the ORACLE database and includes the core features of `mod_plsql`.

Application Express Engine

This module mainly renders and processes the implemented pages. It also performs some other tasks including session state management, authentication/authorization services, page flow control and validations processing.

The overall process is happens as follows.

- 1- User sends URL request from a web browser.
- 2- These URL requests traslated into APEX PL/SQL calls by PL/SQL gateway.
- 3- The PL/SQL call is executed.
- 4- After the database process, the results are sent back to browser as HTML.

This overall process described above is repeated each time when user requests or submits a page. The applications state is managed in the database table within APEX. It does not use a dedicated database connection. Each request is made through a new database session. Thus consuming minimal CPU resources.

3- ER Diagrams and Data Dictionary

The ER Diagram of the Web Based Cinema Application is given in Figure and the detailed information is given below.

- **WGR_ROLES:** This is the table that holds the role details such as role name, role description, role coefficient etc... The PK of this table is ROL_ID. There are also two FKs in this table named ROL_MANAGER_ID and ROL_PARENT_ID which are also migrated from same table. This FKs are used to manage the association between roles.
- **WGR_USERS:** This is the table that holds the user details such as name, first name, last name, gender, nationality, city, adress etc... In addition to that there are two more attributes that need to be mentioned. One of them is USR_COEFFICIENT. This attribute is used to hold an coefficient that will be used to define ticket price for each user. For example, the coefficient for a student will be different than user who has an occupatipon. The other attribute is status which will be used to differentiate registered and unregistered users.
- **WGR_USR_ROLES:** This table holds the user and role association via the USR_ID and ROL_ID FKs.
- **WGR_CITIES:** This table holds the information about cities. Such as name, status, description etc...
- **WGR_COUNTY:** This table holds the information about countries. Such as name, status, description etc...
- **MOV_TYPES:** This table holds the information about the description and name of film types such as drama, science fiction etc...
- **MOV_MOVIES:** This table holds the detailed information about the films. Some attributes of this table are MOV_TITLE, MOV_DESC, MOV_YEAR,

MOV_DURATION, MOV_RELEASE_DATE, MOV_IS_ON_SCREEN and MOV_NOTES.

- **MOV_ROLES:** This table holds the different role types in a film such as director, leading role etc... This table contains the name and the description of the role.
- **MOV_ACT:** This table holds information about the artists that take role in the film. Attributes of the MOV_ACT are MAC_FIRST_NAME, MAC_LAST_NAME and MAC_INFO.
- **MOV_CAST:** This table associates three tables namely, MOV_MOVIES, MOV_ROLES and MOV_ACT. The relation among films, roles in a film and the artists playing that role is holded in this table. By this way one can query according to artist and director .
- **MOV_DETAILS:** This table holds the types of movies.
- **MOV_RATING:** This table holds the rating information per film. It relates the film and the user by the migrated FKs MOV_ID and USR_ID. The rating given to a film by a registered user is hold in attribute MRT_VALUE.
- **CNM_CINEMA:** This table holds the detailed information for cinemas. This information includes cinema name, cinema adress, description and price. This tabel also contains the CIT_ID and CTY_ID sas migrated foreign keys.
- **CNM_HOUSE:** This table holds the information about the saloon. The horizontal length, vertical length and nameof the saloon are holded in this table.
- **CNM_SEAT:** This table holds the place of the seat in the saloon according to the widht and length information supplied at CNM_HOUSE table. The status gives information about if it is a seat or not.
- **CNM_SCHEDULE:** This table holds the schedule of a saloon and the film. It relates the saloons and movies. This table holds date, start and end time of the movies.

- **MOV_PURCHASE:** This table holds the information about the reservations made by customers. The user, saloon and the seat informations are hold at this table too by FKs namely USR_ID, SCH_ID and CST_ID. The purchase type attribute differentiates if the seat is a reservation or purchased.

Except from the attributes described above, there are five more common attribute in each table. These are described below.

STATUS: This attribute is used for soft deletion to mark record as deleted unless it is used for other purposes as described previously.

INSDATE: This attribute is used to hold the insertion date time for each record.

INSBY: This attribute is used to hold the data owner. That is who inserts the record for confirmation purposes and managing the data.

UPDDATE: This attribute is used to hold the last update date time for each record. When an update is realized in this record this attribute is also updated.

UPDBY: This attribute is used to hold the information of who updates the data for confirmation purposes and managing the data.

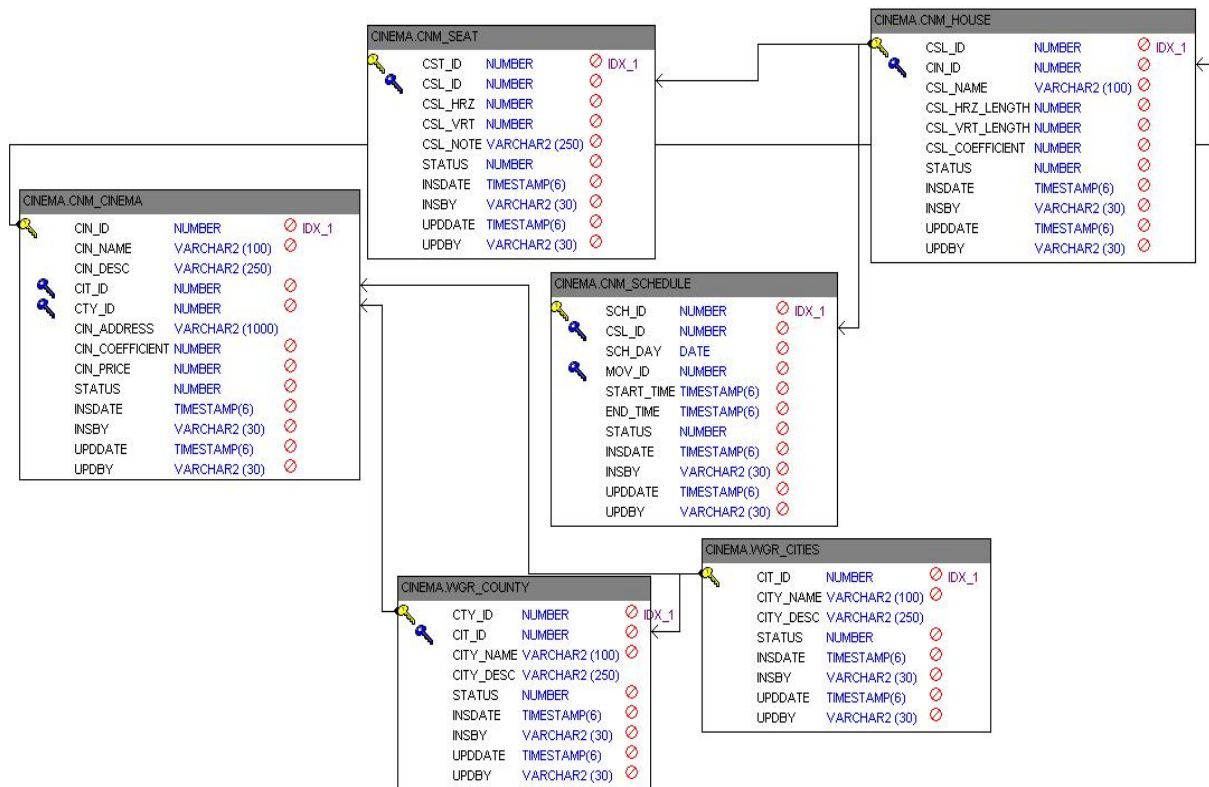


Figure 3. Cinema Module

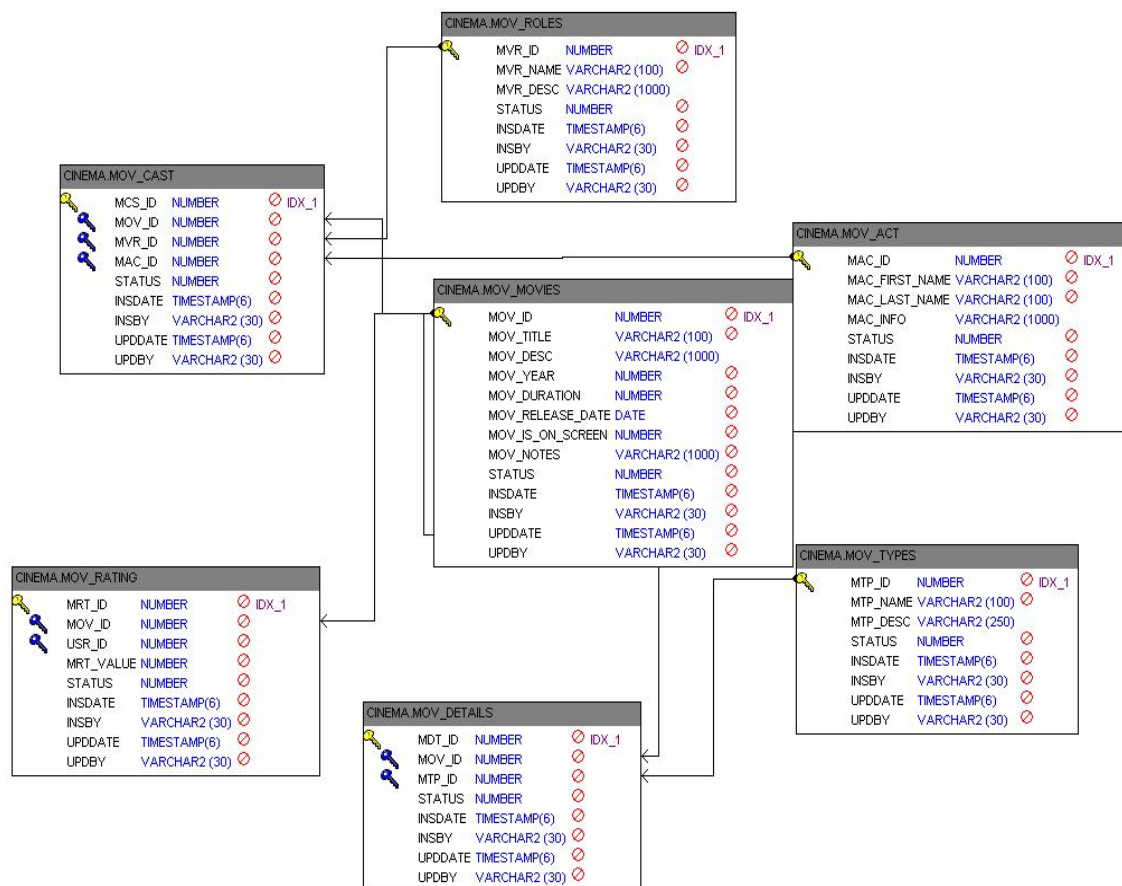


Figure 4. Movie Module

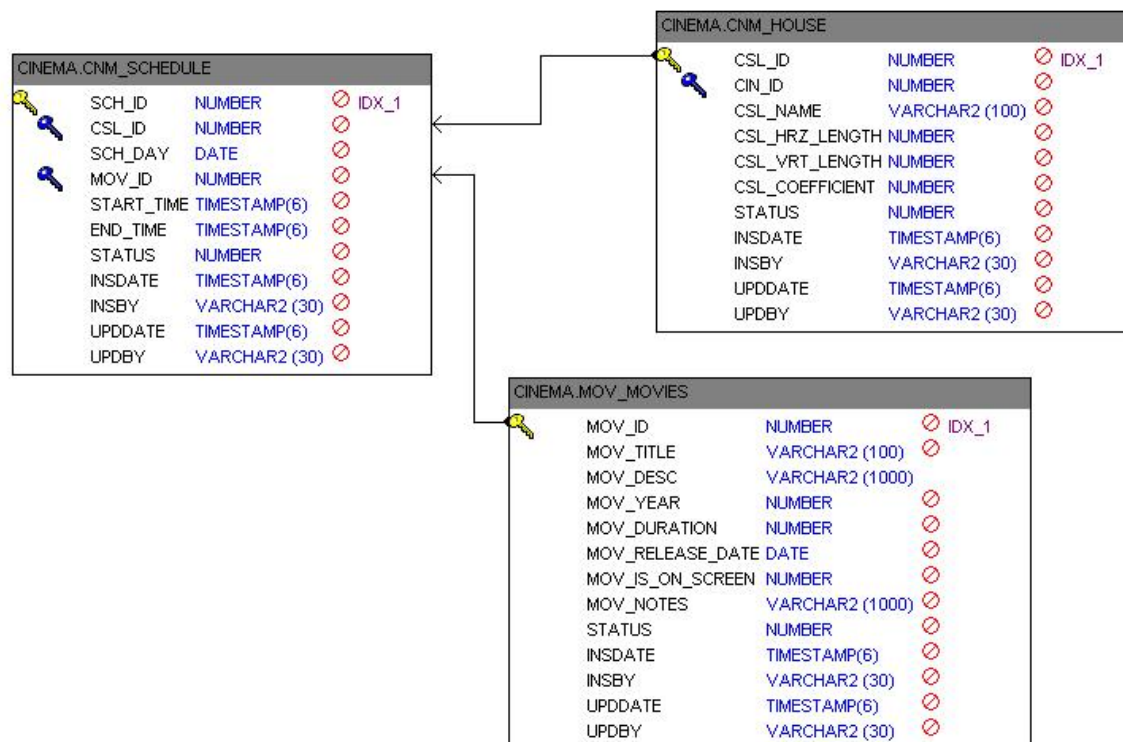


Figure 7. Schedule Module

4- Pages

In this application, we use database stored procedures and APEX pages in order to define business logic of the application. In our project we do not have classes, so we provide detailed definition of pages and stored procedures to show the design thoroughly. Below information about each page are listed.

- **1 Home Page:** The home page of the application on which links to the main modules are shown on the page.
- **10000 Cinema Home Page:** The home page of the cinema module. There are links to the other pages related to cinema module such as cinema list, cinema definition, cinema house list, house definition and seat plan.
- **11110 Cinema List:** Previously defined cinemas are listed in this page. Using the links on this page, navigation to form on cinema is supplied in order to edit, update or create records.
- **11160 Form on Cinema:** Cinema creation or update form is provided in this page. Information about cinema such as city, county, name, description, address, coefficient and ticket price are shown on the page.
- **12110 Cinema House List:** Previously defined cinema houses are listed in this page. Using the links on this page, navigation to form on cinema house is supplied in order to edit, update or create records.
- **12160 Form on Cinema House:** This page is used to create, update or delete cinema houses. In this page, cinema of the house is defined, house name, maximum horizontal length, maximum vertical length and coefficient is inserted by the Management Staff. Maximum horizontal and vertical lengths are used in Page 12170 to show seat plan in matrix notation with those provided values. Users can define each point either as a seat or blank in the matrix. By this way, customizable house seat plans can be formed.

- **12170 Cinema House Seat Plan:** As stated above, seat plan of a cinema house is formed in this page. Initially every point on the matrix is shown as a seat, and users can disable any seat by clicking on the point. After every operation is completed, users save their seat plan.
- **13110 Cinema Schedule List:** The list of defined schedules are shown in this page. Schedules are composed of house, day, movie, start time and end time information.
- **13160 Form on Cinema Schedule:** The schedule of a cinema house is arranged using this page.
- **20000 Movie Home Page:** The home page of the movie module. There are links to the other pages related to movie module such as movie types, movies, movie roles and movie staff.
- **21110 Movie Type List:** Previously defined movie types are listed in this page such as “Horror”, “Action”, “Comedy”, etc.
- **21160 Form on Movie Types:** Movie types are defined using this page.
- **22110 Movie List:** Defined movies are listed in this page. Movies can have the following information: Movie title, description, year, duration, release date, is-on-screen information, notes, types of the movie, cast of the movie.
- **22160 Form on Movies:** Movie creation is handled like a wizard which is completed in 4 steps. In this first page, general information like movie title, description, year, duration, release date and is-on-screen information is entered.
- **22161 Form on Movies II:** Since a movie can have several types, in this page type of the movies are selected.
- **22162 Form on Movies III:** In the third step, cast of the movie is formed. Each person is previously defined in staff list and each role is previously defined in movie

role list. So, users can define a person as the director and producer of a movie by defining him/her as director and then producer in this page.

- **22163 Form on Movies Summary Page:** All of the information entered in the previous three pages are summarized in this page and confirmation is requested. After confirmation all the information are entered into several database tables in one step.
- **23110 Movies Role List:** Previously defined roles in a movie such as director, actor, producer, etc. are listed in this page.
- **23160 Form on Movie Roles:** Form of movie roles are provided in this page. A movie role has role name and description information.
- **24110 Staff List:** The staff which will be defined in a movie is listed in this page. For example, if a movie has a director named “Spielberg” and a leading actor named “Pacino”, then these people should first be inserted into this list. Once a person is inserted, he/she can be used in numerous movies.
- **24160 Form on Staff:** Form of staff consists of firstname, lastname, and personal information fields.
- **30000 Processes Home Page:** This is the home page of the processes such as cinema querying, movie querying and ticket purchasing.
- **31110 Cinema Query Page:** Using this page, cinemas can be queried by filling necessary information fields. Users can search cinemas near to their home address in a very quick operation.
- **31120 Cinema Info Page:** Detailed information about queried cinemas are shown in this page.
- **31210 Movie Query Page:** Movies can be queried according to several criteria using this page.

- **31220 Movie Info Page:** Detailed information about movies are shown in this page.
- **32110 User Purchase History Page:** Users' personal purchase history is shown in this page. By using this page, users can delete their reservations, cancel their purchased tickets and review their purchase history.
- **32160 Ticket Purchase Page:** This page can be used to reserve and purchase tickets of a selected movie schedule. Users can see the seating plan and purchase their tickets accordingly from the remaining seats which are shown on the matrix.
- **40000 Definitions Home Page:** This is the home page of the definition module which will be used by Management Staff and Administrators.
- **41110 List of Cities:** Cities which will be used while defining the cinemas are listed in this page.
- **41160 Form on Cities:** This page is form of the cities table.
- **42110 County List:** Counties which will be used while defining cinema locations and user addresses are listed in this page.
- **42160 Form on Counties:** This page provide city information and name of the county.
- **43110 Roles List:** Roles of the application are listed in this page. Roles may be increased only by Administrators.
- **43160 Form on Roles:** Roles of the application are defined using this page.
- **44110 Users List:** Users which can use the application either to manage application or purchase tickets are listed in this page. New requests for the application can be reviewed and approved by using this page.

- **44160 Form on Users:** New users fill this form to request membership for this application by providing personal information.
- **44210 Users-Roles List:** Roles of the users are shown in this page. Every customer has the basic role privilege.
- **44260 Form on Users-Roles:** Roles are given to users using this page.

5- User Interface Design

Some prototypes of the user interfaces are listed below:

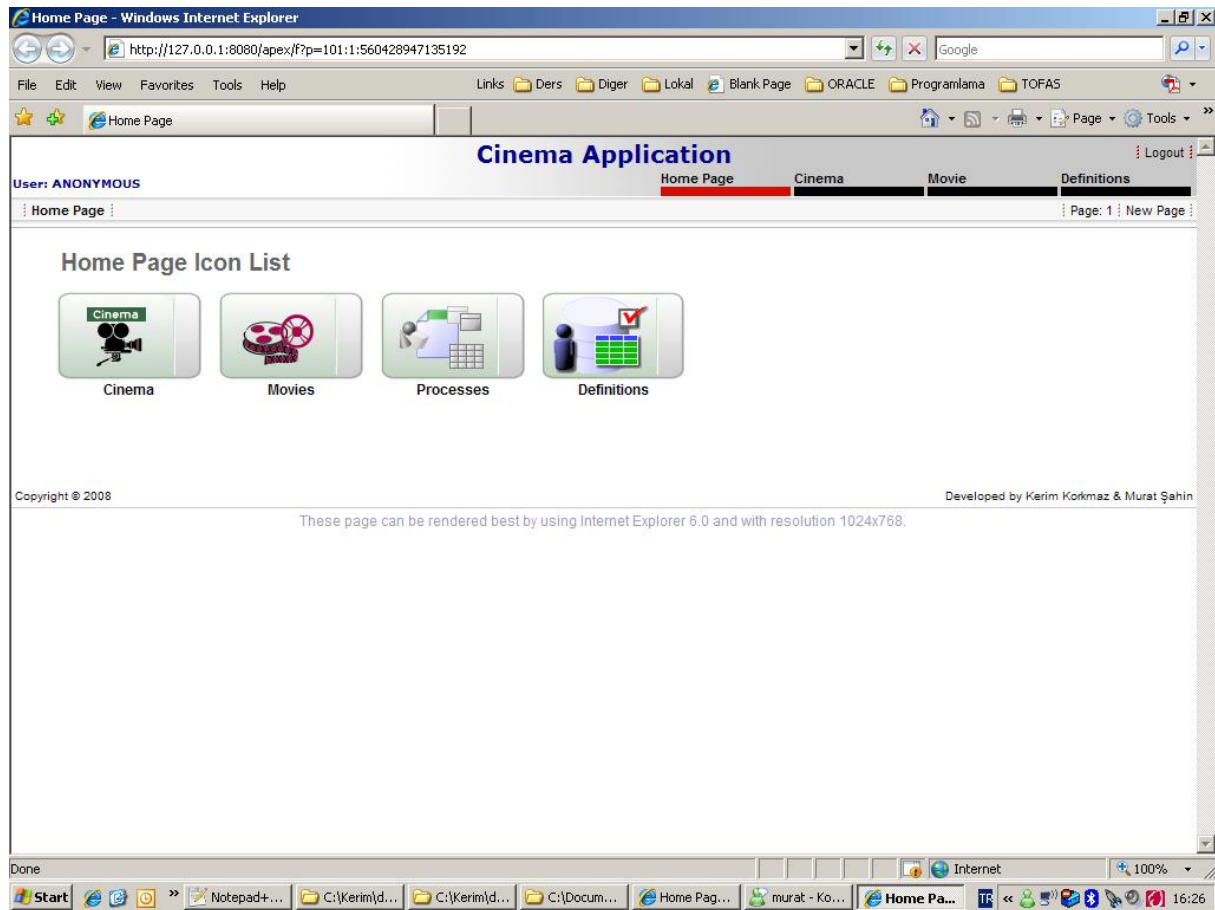


Figure 8. Home Page

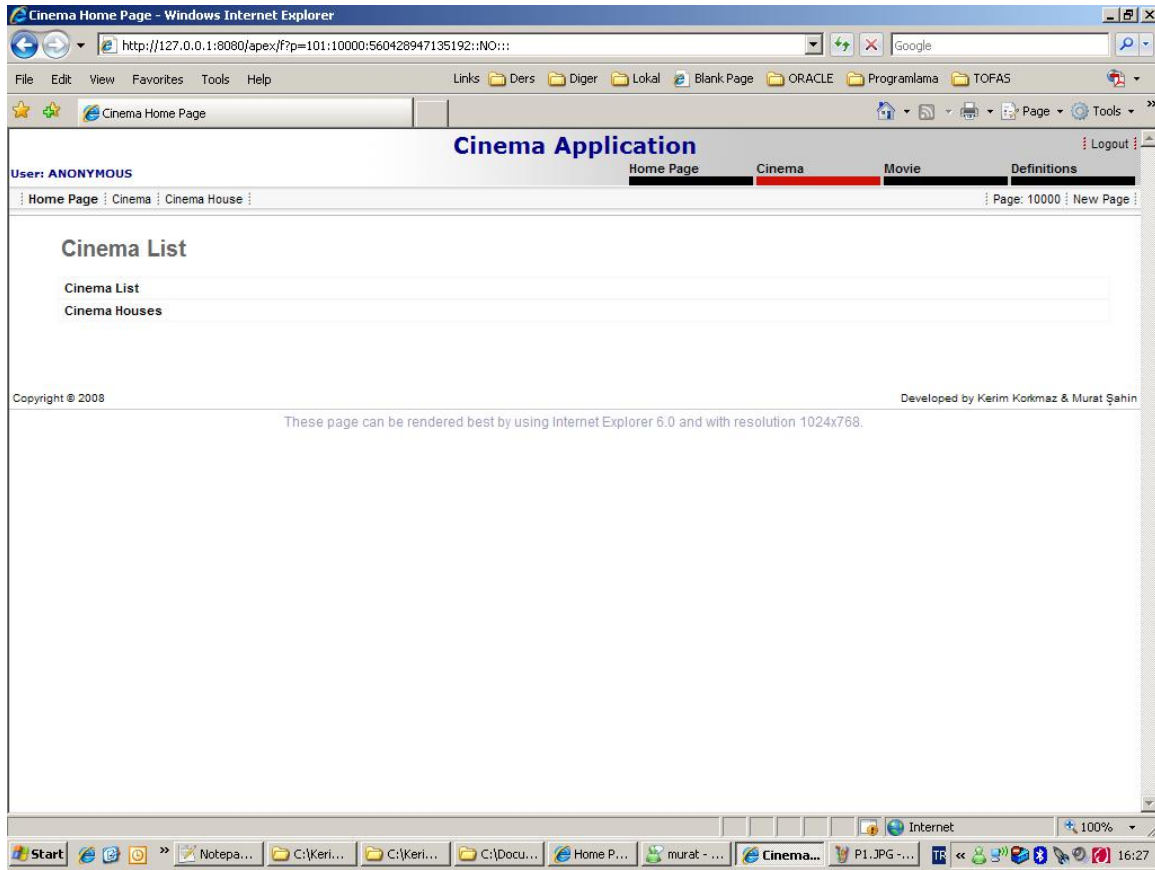


Figure 9. Cinema Module Home Page

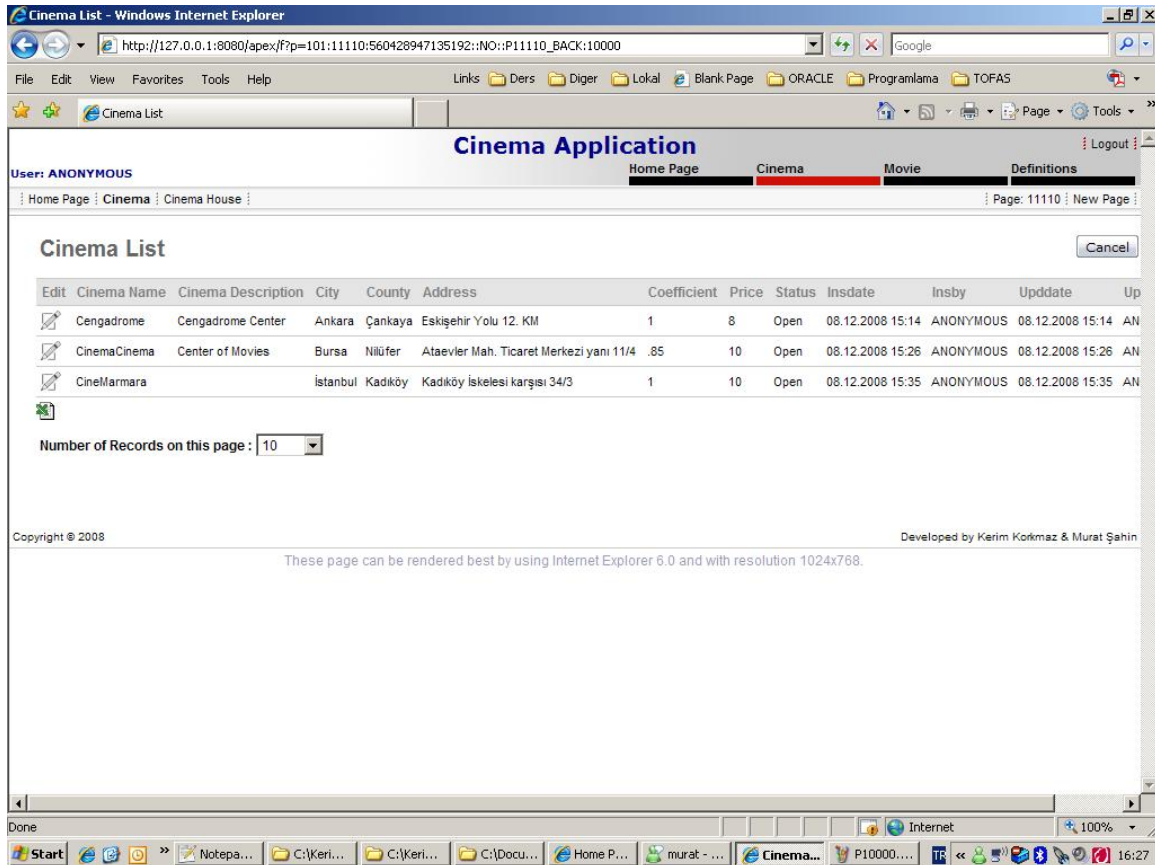


Figure 10. Cinema List

Form on Cinema - Windows Internet Explorer

http://127.0.0.1:8080/apex/f?p=101:11160:560428947135192::NO::P11160_CIT_ID:3

File Edit View Favorites Tools Help Links Ders Diger Lokal Blank Page ORACLE Programlama TOFAS

Form on Cinema

Cinema Application Logout

User: ANONYMOUS Home Page Cinema Movie Definitions

Home Page Cinema Cinema House Page: 11160 New Page

Form on Cinema Cancel Create

City: Istanbul

County: Kadıköy

Cinema Name: Cinema34

Cinema Description:

Address: Kadıköy İskelesi Karşısı No: 19/07

Coefficient: 1

Ticket Price: 10

Status: Open

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These page can be rendered best by using Internet Explorer 6.0 and with resolution 1024x768.

Start Notepad... C:\Keri... C:\Keri... C:\Docu... Home P... murat - ... Form o... P11110... 16:29

Figure 11. Cinema Form

Cinema House List - Windows Internet Explorer

http://127.0.0.1:8080/apex/f?p=101:12110:560428947135192::NO

File Edit View Favorites Tools Help Links Ders Diger Lokal Blank Page ORACLE Programlama TOFAS

Cinema House List

Cinema Application Logout

User: ANONYMOUS Home Page Cinema Movie Definitions

Home Page Cinema Cinema House Page: 12110 New Page

Cinema House List Cancel Create

Edit	Seats	Cinema	House Name	Hz. Length	Vrt. Length	Coefficient	Status	Insdate	Insby	Update	Updby
		Cengadrome	House 01	12	10	1	Open	12.12.2008 23:07	ANONYMOUS	13.12.2008 14:58	ANONYMOUS

Number of Records: 10

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These page can be rendered best by using Internet Explorer 6.0 and with resolution 1024x768.

Done Start Notepad... C:\Keri... C:\Keri... C:\Docu... Home P... murat - ... Cinema... P11160... 16:29

Figure 12. Cinema House List

[illegible]

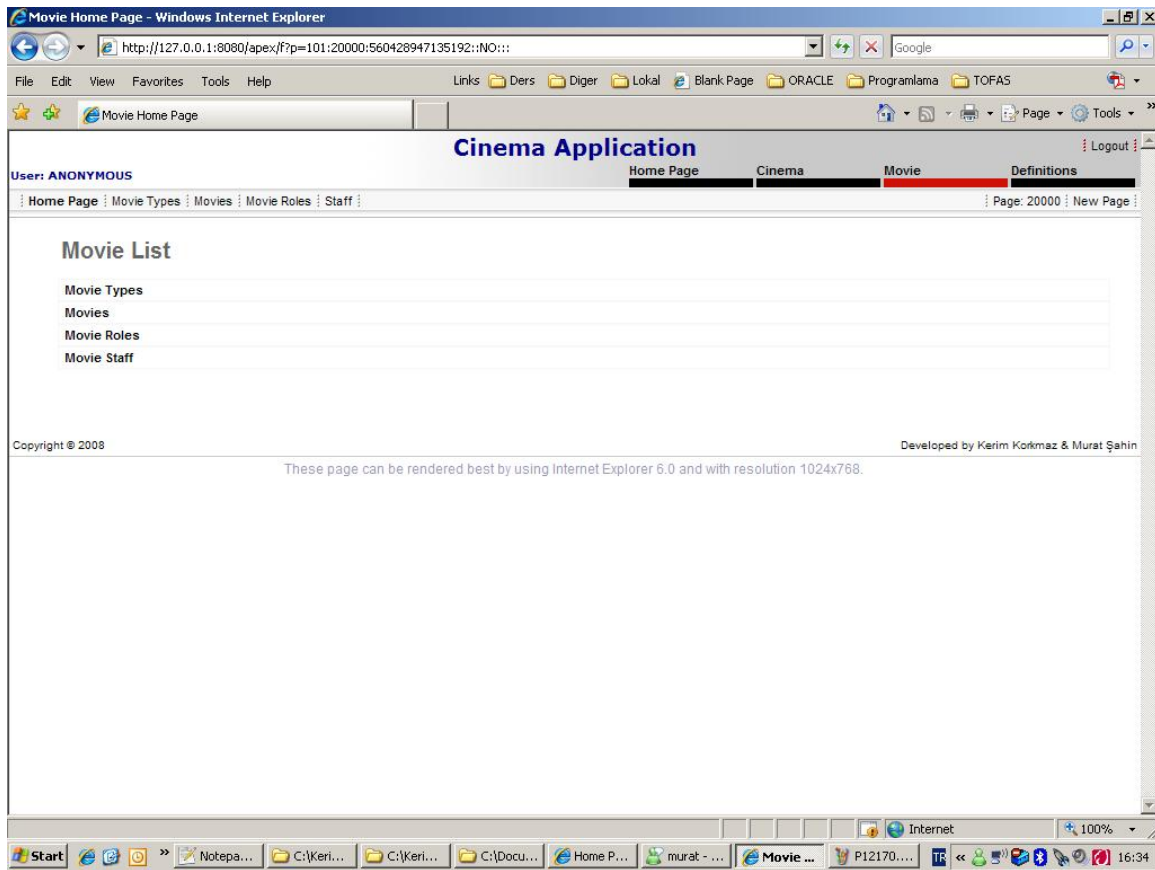


Figure 15. Movie Module Home Page

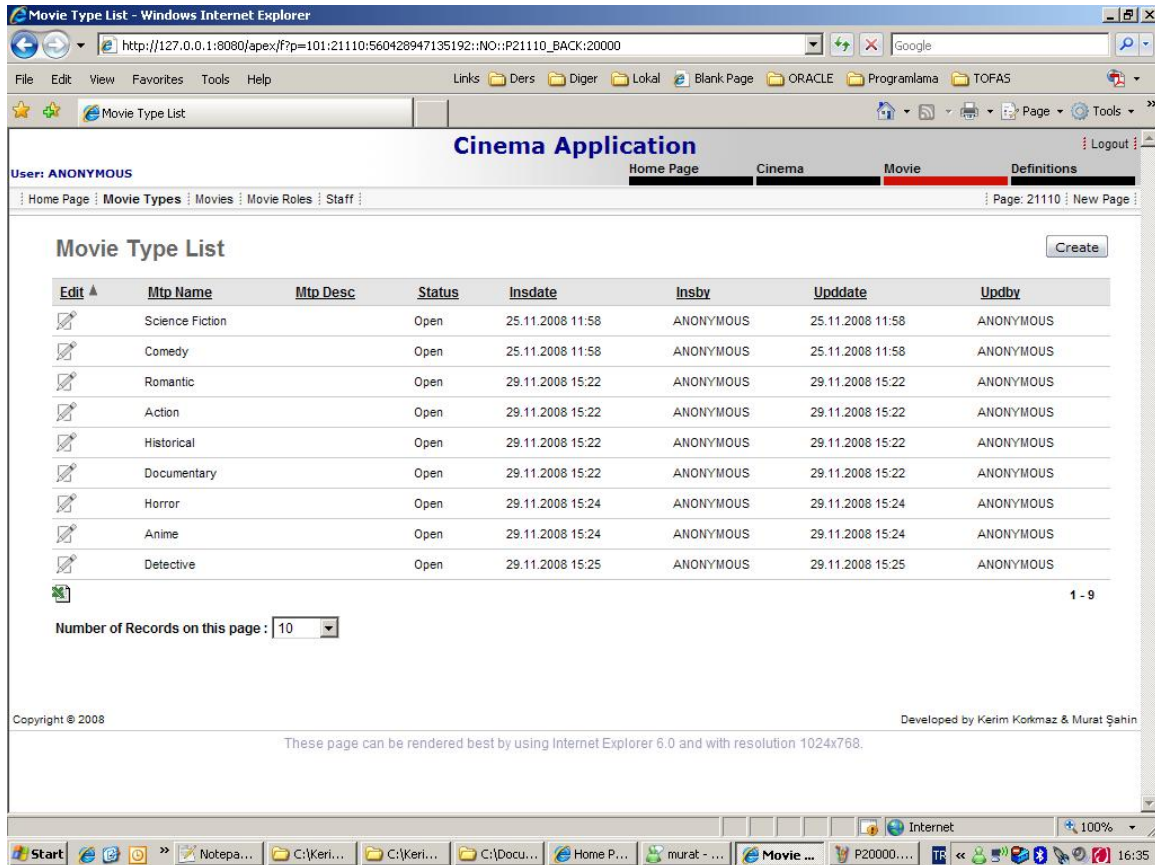


Figure 16. Movie Type List

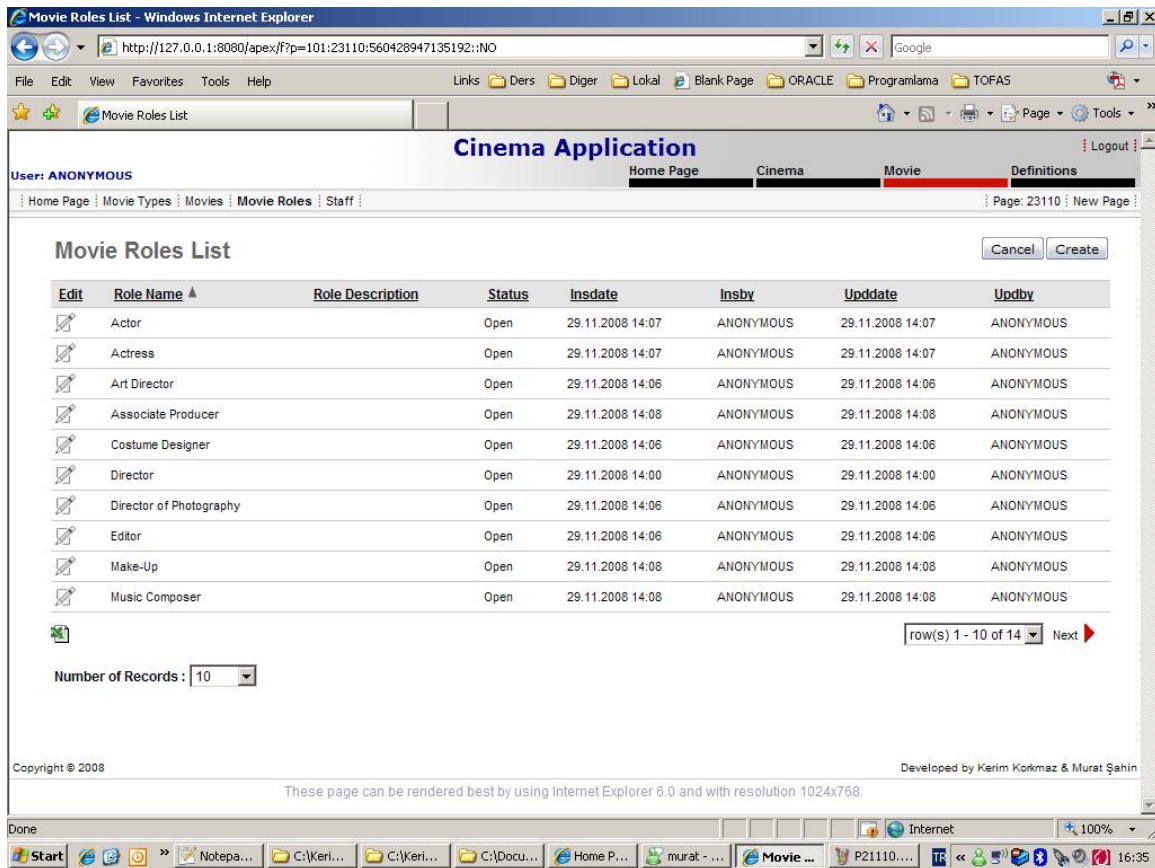


Figure 17. Movie Roles List

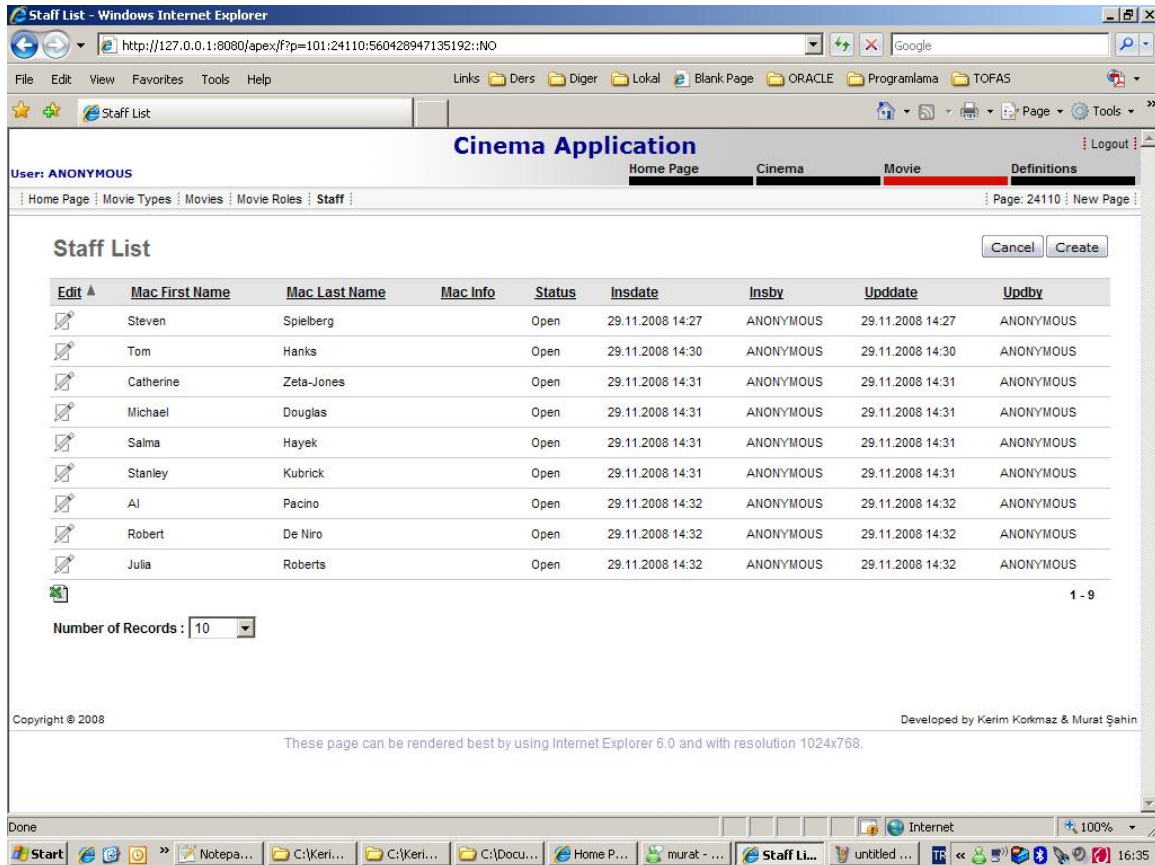


Figure 18. Movie Staff List

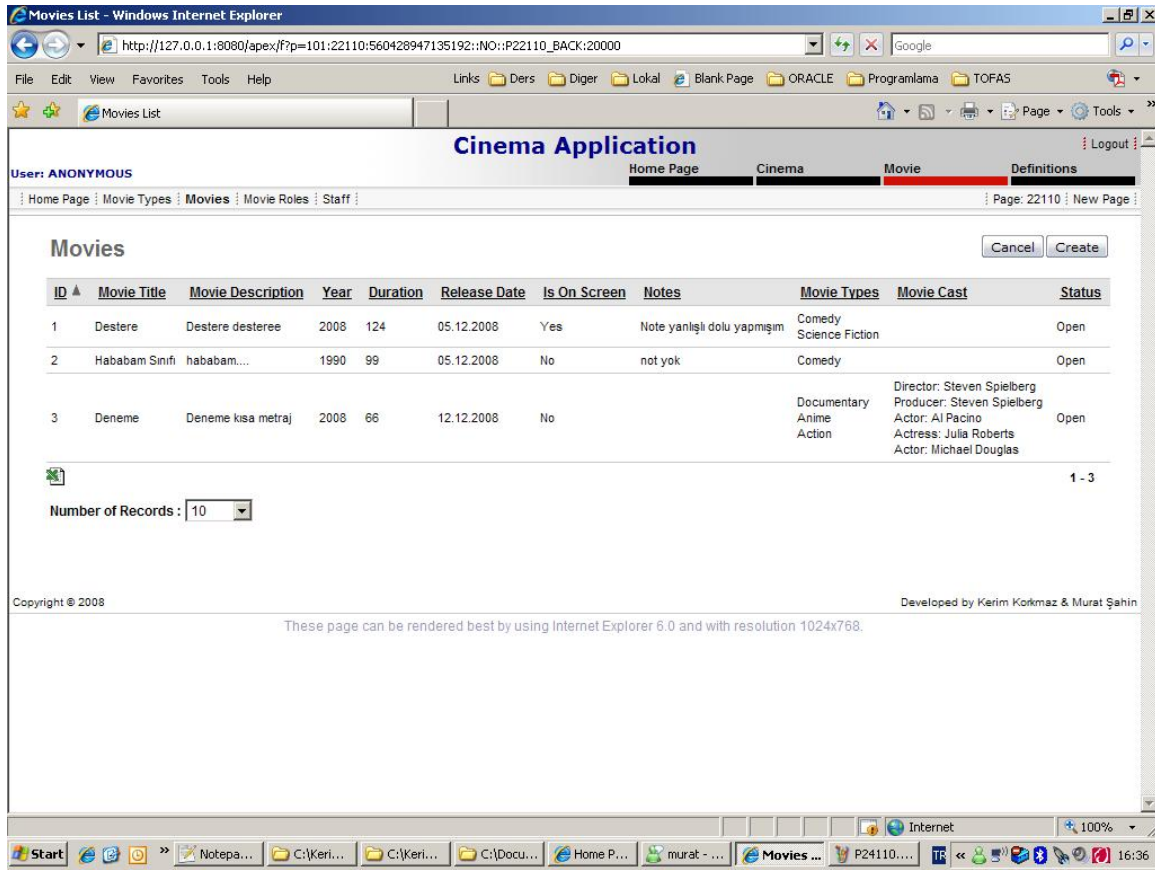


Figure 19. Movie List

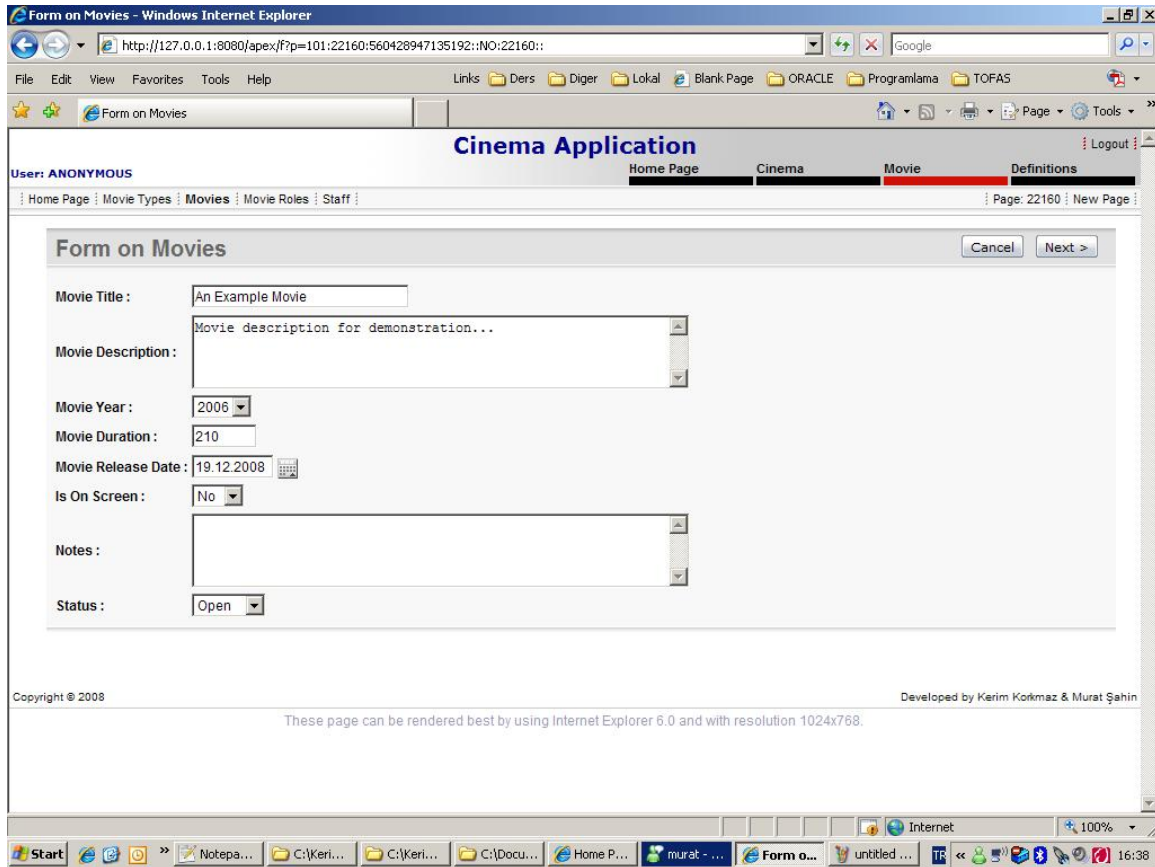


Figure 20. Movie Form Step I

Form on Movies II - Windows Internet Explorer

http://127.0.0.1:8080/apex/f?p=101:22161:560428947135192::NO::

File Edit View Favorites Tools Help Links Ders Diger Lokal Blank Page ORACLE Programlama TOFAS

Form on Movies II

Cinema Application Logout

User: ANONYMOUS Home Page Cinema **Movie** Definitions

Home Page Movie Types Movies Movie Roles Staff Page: 22161 New Page

Movie Cancel < Previous Next >

Title	Movie Description	Movie Year	Duration	Release Date	Is On Screen	Notes	Status
An Example Movie	Movie description for demonstration...	2006	210	19.12.2008	No	-	1

1 - 1

Movie Details

Movie Types: Detective Add

- Science Fiction
- Historical
- Comedy
- Romantic
- Documentary
- Detective
- Action
- Horror
- Anime

Movie Types

Movie Type
Detective
Comedy

1 - 2

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These page can be rendered best by using Internet Explorer 6.0 and with resolution 1024x768.

Done Start Notepa... C:\Keri... C:\Keri... C:\Docu... Home P... murat - ... Form o... P22160... 100% 16:39

Figure 21. Movie Form Step II

Form on Movies III - Windows Internet Explorer

http://127.0.0.1:8080/apex/f?p=101:22162:560428947135192::NO::

File Edit View Favorites Tools Help Links Ders Diger Lokal Blank Page ORACLE Programlama TOFAS

Form on Movies III

Cinema Application Logout

User: ANONYMOUS Home Page Cinema **Movie** Definitions

Home Page Movie Types Movies Movie Roles Staff Page: 22162 New Page

Movie Cancel < Back Next >

Title	Movie Description	Movie Year	Duration	Release Date	Is On Screen	Notes	Status
An Example Movie	Movie description for demonstration...	2006	210	19.12.2008	No	-	1

1 - 1

Movie Types

Movie Type
Detective
Comedy
Action

1 - 3

Movie Cast

Role: Actress Add

Person: Al Pacino

- Actress
- Actor
- Art Director
- Associate Producer
- Costume Designer
- Director
- Director of Photography
- Editor
- Make-Up
- Music Composer
- Producer
- Production Designer
- Screenplay
- Visual Effects Supervisor

Movie Cast

Role	Person
Actress	Julia Roberts
Director	Stanley Kubrick

1 - 2

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Test by using Internet Explorer 6.0 and with resolution 1024x768.

Start Notepa++ - C:\Keri\d... C:\Keri\d... C:\Keri\d... C:\Documents and Setti... Home Page - Windows In... murat - Konuşma Form on Movies III - P22161.JPG - Paint 100% 16:41

Figure 22. Movie Form Step III

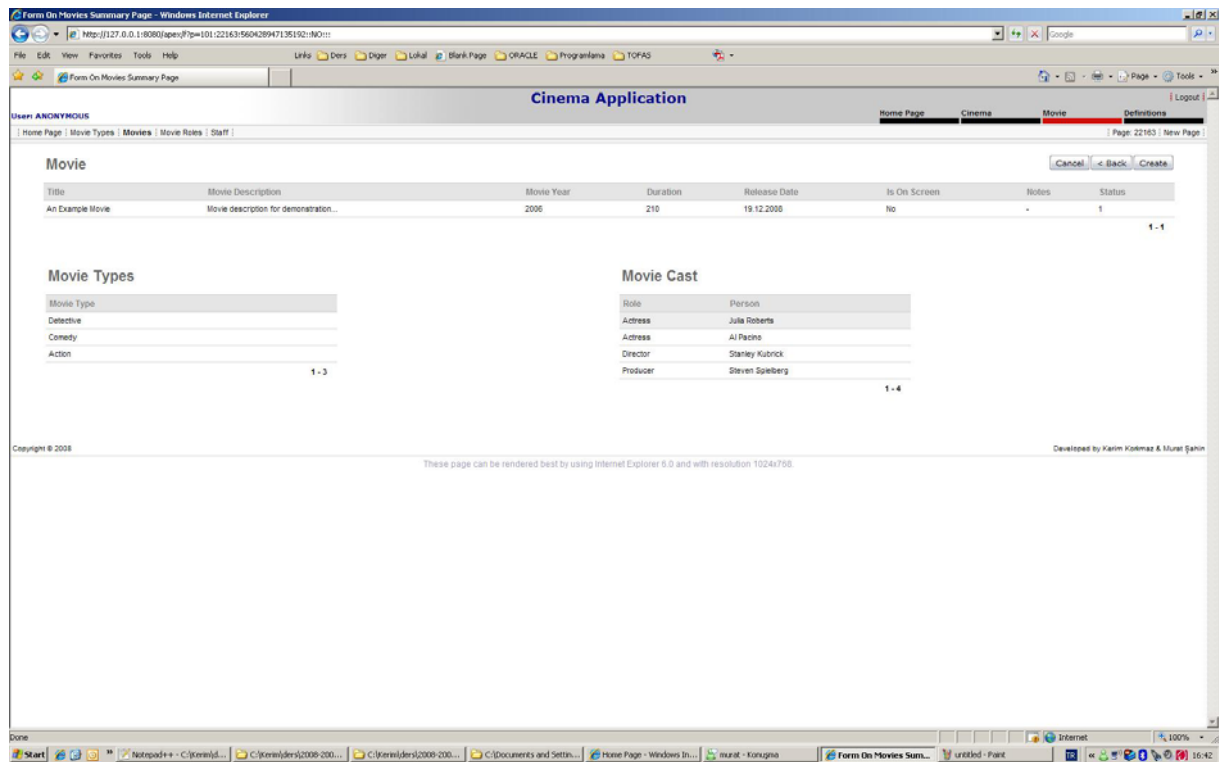
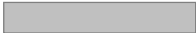
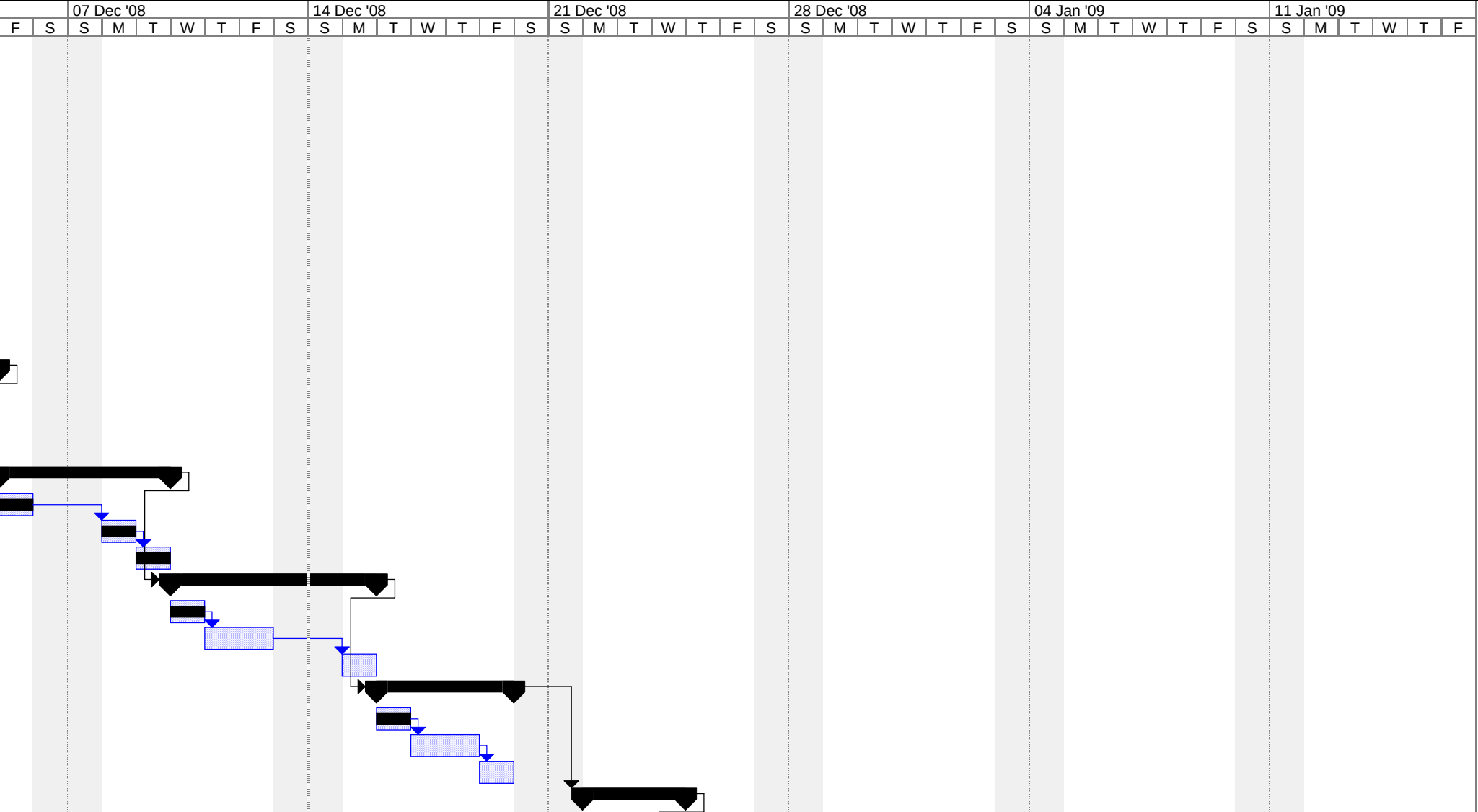


Figure 23. Movie Form Step IV

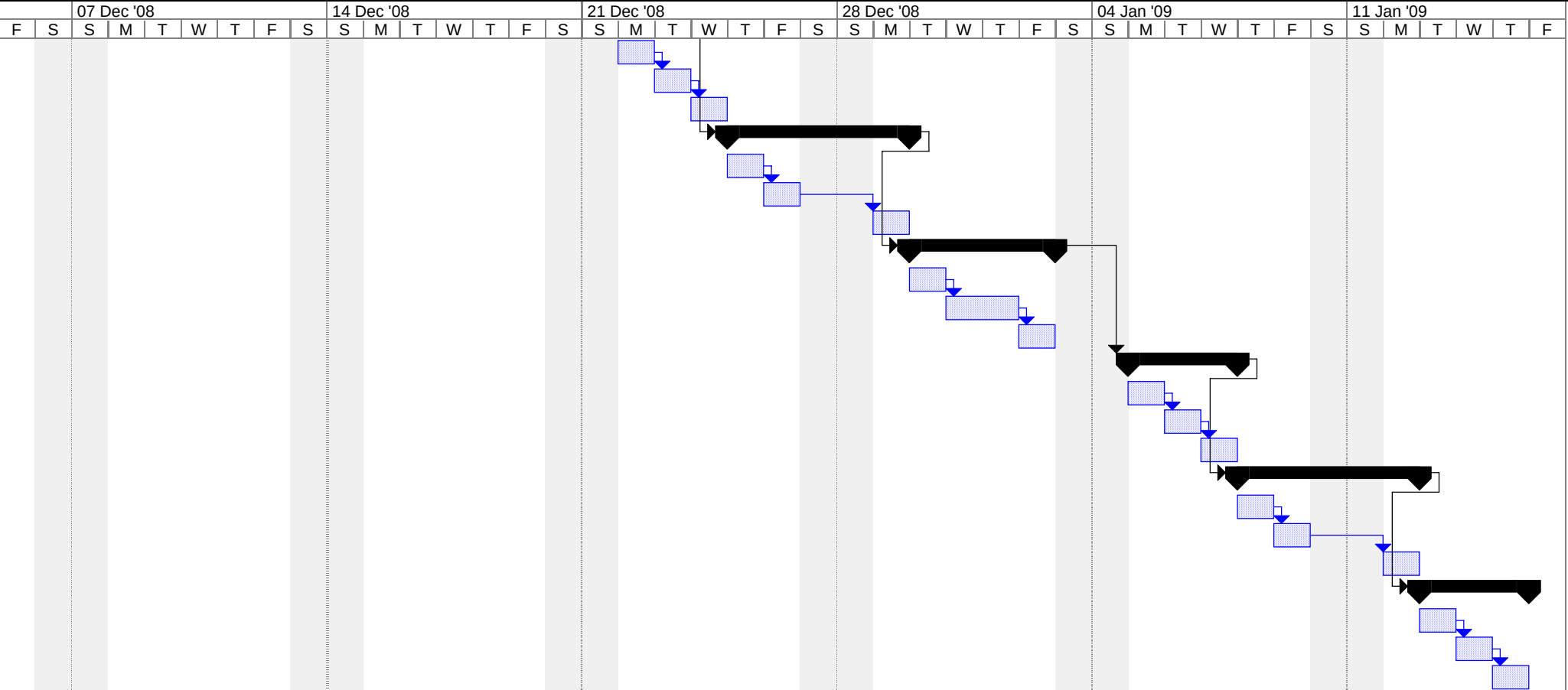
ID	Task Name	Duration	Start	Finish	16 Nov '08								23 Nov '08							30 Nov '08				
					S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T
30	Querying Cinema Design	1 day	Mon 22.12.08	Mon 22.12.08																				
31	Querying Cinema Implementation	1 day	Tue 23.12.08	Tue 23.12.08																				
32	Querying Cinema Testing	1 day	Wed 24.12.08	Wed 24.12.08																				
33	Querying Movies	3 days	Thu 25.12.08	Mon 29.12.08																				
34	Querying Movies Design	1 day	Thu 25.12.08	Thu 25.12.08																				
35	Querying Movies Implementation	1 day	Fri 26.12.08	Fri 26.12.08																				
36	Querying Movies Testing	1 day	Mon 29.12.08	Mon 29.12.08																				
37	Reservation – Purchase – Cancel Tickets	4 days	Tue 30.12.08	Fri 02.01.09																				
38	Reservation – Purchase – Cancel Tickets Design	1 day	Tue 30.12.08	Tue 30.12.08																				
39	Reservation – Purchase – Cancel Tickets Impleme	2 days	Wed 31.12.08	Thu 01.01.09																				
40	Reservation – Purchase – Cancel Tickets Testing	1 day	Fri 02.01.09	Fri 02.01.09																				
41	Rating Movies	3 days	Mon 05.01.09	Wed 07.01.09																				
42	Rating Movies Design	1 day	Mon 05.01.09	Mon 05.01.09																				
43	Rating Movies Implementation	1 day	Tue 06.01.09	Tue 06.01.09																				
44	Rating Movies Testing	1 day	Wed 07.01.09	Wed 07.01.09																				
45	Authentication	3 days	Thu 08.01.09	Mon 12.01.09																				
46	Design of Sign-in and Sign-Up mechanisms	1 day	Thu 08.01.09	Thu 08.01.09																				
47	Implementation of Sign-in and Sign-Up mechanisn	1 day	Fri 09.01.09	Fri 09.01.09																				
48	Testing of Sign-in and Sign-Up mechanisms	1 day	Mon 12.01.09	Mon 12.01.09																				
49	Authorization	3 days	Tue 13.01.09	Thu 15.01.09																				
50	Design of Authorization Mechanisms	1 day	Tue 13.01.09	Tue 13.01.09																				
51	Implementation of Authorization Mechanisms	1 day	Wed 14.01.09	Wed 14.01.09																				
52	Testing of Authorization Mechanisms	1 day	Thu 15.01.09	Thu 15.01.09																				

Project: MSProj11 Date: Sun 14.12.08	Task		Rolled Up Task		External Tasks	
	Progress		Rolled Up Milestone		Project Summary	
	Milestone		Rolled Up Progress		Group By Summary	
	Summary		Split		Deadline	

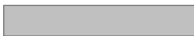
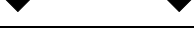


Project: MSProj11
Date: Sun 14.12.08

Task		Rolled Up Task		External Tasks	
Progress		Rolled Up Milestone		Project Summary	
Milestone		Rolled Up Progress		Group By Summary	
Summary		Split		Deadline	



Project: MSProj11
Date: Sun 14.12.08

Task		Rolled Up Task		External Tasks	
Progress		Rolled Up Milestone		Project Summary	
Milestone		Rolled Up Progress		Group By Summary	
Summary		Split		Deadline	